EXCERCISE C40

EJERCICIO C40

Find all solutions to the system of equations below, making use of the matrix inverse found in Exercise MISCLE. C28

encuentre todas las posibles soluciones del siguiente sistema de ecuaciones, haciendo uso de la matriz inversa. encontrada. Exercise MISCLE. C28

$$\begin{aligned} x_1 + x_2 + 3x_3 + x_4 &= -4 \\ -2x_1 - x_2 - 4x_3 - x_4 &= 4 \\ x_1 + 4x_2 + 10x_3 + 2x_4 &= -20 \\ -2x_1 - 4x_3 + 5x_4 &= 9 \end{aligned}$$

SOLVE:

SOLUCION:

View this system as $\mathcal{LS}(C,\ \mathrm{b})$, where C is the 4×4 matrix from ⟨acronymref | exercise | MISLE.C28⟩ and b= $\left[\begin{pmatrix} -4 \\ 4 \\ -20 \\ 9 \end{pmatrix}\right]$

Since C was seen to be nonsingular in ⟨acronymref|exercise|MISLE.C28⟩ ⟨acronymref|theorem|SNCM⟩ says the solution, which is unique by ⟨acronymref|theorem|NMUS⟩, is given by

Vea este sistema como: $\mathcal{LS}(C,\ \mathrm{b})$, donde C es la matriz 4×4 del ⟨acronymref | exercise | MISLE.C28⟩ y b= $\left[\begin{pmatrix} -4 \\ 4 \\ -20 \\ 9 \end{pmatrix}\right]$

dado que C esta denotada como no singular en ⟨acronymref|exercise|MISLE.C28⟩ ⟨acronymref|theorem|SNCM⟩que nos da la solucion, la cual es unica por ⟨acronymref|theorem|NMUS⟩ y esta dada por

$$C^{-1}\mathrm{b} = \begin{pmatrix} 38 & 18 & -5 & -2 \\ 96 & 47 & -12 & -5 \\ -39 & -19 & 5 & 2 \\ -16 & -8 & 2 & 1 \end{pmatrix} \begin{pmatrix} -4 \\ 4 \\ -20 \\ 9 \end{pmatrix} = \begin{pmatrix} 2 \\ -1 \\ -2 \\ 1 \end{pmatrix}$$

Notice that this solution can be easily checked in the original system of equations.

Note que esta solucion,puede ser comprobada facilmente en el sistema original de ecuaciones.